

**SPECTRALLY EFFICIENT FQPSK, FGMSK, AND FQAM
FOR ENHANCED PERFORMANCE CDMA, TDMA, GSM, OFDM,
AND OTHER SYSTEMS**

ABSTRACT

Spectral efficient transmitters-receivers (transceivers), modulation-demodulation (Modem) methods, architectures, structures and implementation technologies for enhanced performance and increased capacity CDMA, TDMA, GSM, OFDM, CMA, FDM and other wireless and wired communications, broadcasting and telemetry systems and integrated Modems/Transceivers suitable for operation over Non-Linearly Amplified (NLA) power efficient RF systems are described. Cross-correlated cascaded Time Constrained Signal (TCS) response processors and Long Response (LR) filtered Bit Rate Agile (BRA) in phase (I) and quadrature phase (Q) baseband signals are disclosed. These spectral efficient high performance processing, transmitting and receiving methods are designated as Feher's Quadrature Phase Shift Keying (FQPSK) Transceivers. Integrated Modem and transceiver technologies also disclosed herein and designated as Feher's Quadrature Amplitude Modulation (FQAM), Feher's Gaussian Minimum Shift Keying (FGMSK) and Feher's Minimum Shift Keying (FMSK) are subsets of 2nd generation FQPSK systems. Bit rate and RF agile embodiments are described. The 2nd generation of FQPSK systems with Adaptive Antenna Arrays (AAA) and adaptive Feher Equalizers (FE) and smart diversity systems has additional enhanced spectral/RF power efficiency and end-to-end performance advantages.